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(54) **Developing device, image forming apparatus, image forming system.**

(57) A developing device (54) for developing a latent image borne on an image bearing body (20) using a developer (T) borne on a developer bearing roller (510), is provided with: a housing (540) that is for containing the developer (T) and that has an opening (572); the developer bearing roller that is for bearing the developer and that is provided facing the opening; a sealing member (520) that abuts against the developer bearing roller to prevent the developer from spilling; a supporting member that is attached to the housing and that is for supporting the developer bearing roller and the sealing member; and an urging member that is for urging the sealing member toward the developer bearing roller and that is provided between the supporting member and a surface of the sealing member on an opposite side from an abutting surface of the sealing member with which the sealing member abuts against the developer bearing roller.

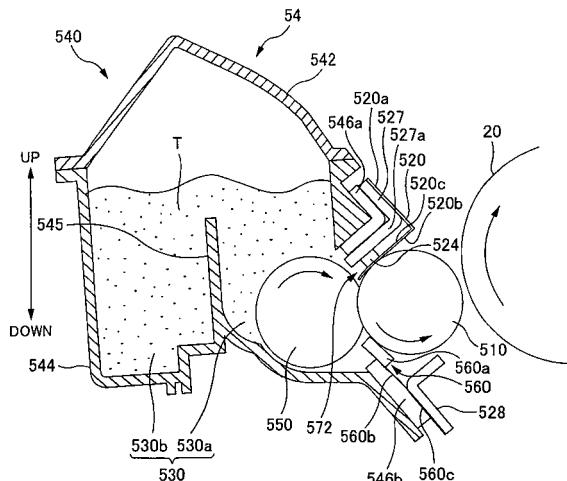


Fig.4



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EUROPEAN SEARCH REPORT

Application Number
EP 05 00 5003

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X,D	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) -& JP 2003 280371 A (SEIKO EPSON CORP), 2 October 2003 (2003-10-02) * abstract *	1-8, 14-16, 25,26, 28-30, 44,45 9-13, 17-24, 27,36, 37,41 46-54	G03G15/08
Y	-----	9,13, 17-24,27	
A	-----	9,13, 17-24,27	
Y	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 07, 3 July 2003 (2003-07-03) -& JP 2003 076144 A (CANON INC), 14 March 2003 (2003-03-14) * abstract; figures 5,6,9,15 * * paragraph '0036! - paragraph '0042! *	9,13, 17-24,27	
Y	-----	9,13, 17-24,27	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	US 5 585 895 A (YASHIRO ET AL) 17 December 1996 (1996-12-17) * column 6, line 10 - column 7, line 42; figures 7,8 *	1,13-16, 27-30	G03G
-----	-----	-----	
A	US 6 125 250 A (KAMIO ET AL) 26 September 2000 (2000-09-26) * column 4, line 47 - column 5, line 58; figure 4 *	1,13-16, 27-30	
-----	-----	-----	
X	US 2002/028086 A1 (SATO FUMIKAZU ET AL) 7 March 2002 (2002-03-07)	44-46, 55,56	
Y	* the whole document *	10-12, 48-50	
A	-----	47,51-54	
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The present search report has been drawn up for all claims			
4	Place of search	Date of completion of the search	Examiner
	Munich	29 September 2005	Borowski, M
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 05, 3 May 2002 (2002-05-03) -& JP 2002 014537 A (CANON INC), 18 January 2002 (2002-01-18) * abstract; figures 13,23,24 *	31-33, 35, 38-40, 42,43 36,37,41 34	
Y	-----		
A	US 5 697 021 A (WATANABE ET AL) 9 December 1997 (1997-12-09)	31,32, 38, 44-46, 55,56 48-50	
Y	* column 9, line 29 - line 48; figures 6,7,28,29 *	48-50	
A	* column 13, line 60 - column 15, line 32 *	47,51-54	
Y	-----		
X	US 4 616 919 A (ADLEY ET AL) 14 October 1986 (1986-10-14) * the whole document *	31,32,38	
A	US 6 049 689 A (ISHII ET AL) 11 April 2000 (2000-04-11) * column 13, line 15 - line 32 *	31,39	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Y	-----		
A	US 5 389 732 A (SEKINO ET AL) 14 February 1995 (1995-02-14) * column 1, line 35 - column 5, line 47; figures 2,7 *	48-50 3,13,25, 27,33,41	
Y	-----		
The present search report has been drawn up for all claims			
4	Place of search	Date of completion of the search	Examiner
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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-30

Developing device comprising a supporting member that is attached to the developing device housing and that is for supporting a developer bearing roller and a sealing member.

2. claims: 31-43

Developing device comprising a sealing member between the developing device housing and a developer bearing roller, wherein the flexural rigidity of the sealing member on said side of one end in said lateral direction thereof is larger than a flexural rigidity of said sealing member on said side of the other end in said lateral direction thereof.

3. claims: 44-56

Developing device comprising a sealing member between the developing device housing and a developer bearing roller, wherein a section of said housing that is in opposition to said end sealing member is provided with a cut-out section.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 05 00 5003

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-09-2005

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
JP 2003280371	A	02-10-2003		NONE		
JP 2003076144	A	14-03-2003		NONE		
US 5585895	A	17-12-1996		NONE		
US 6125250	A	26-09-2000	JP	11133736 A		21-05-1999
US 2002028086	A1	07-03-2002		NONE		
JP 2002014537	A	18-01-2002		NONE		
US 5697021	A	09-12-1997		NONE		
US 4616919	A	14-10-1986	DE	3671551 D1		28-06-1990
			EP	0216093 A1		01-04-1987
			JP	1773367 C		14-07-1993
			JP	4065378 B		19-10-1992
			JP	62056975 A		12-03-1987
US 6049689	A	11-04-2000	JP	11052721 A		26-02-1999
US 5389732	A	14-02-1995	JP	2597024 Y2		28-06-1999
			JP	6054055 U		22-07-1994